

FIRST DISTRIBUTIONAL RECORDS OF TABANIDAE (DIPTERA) IN CONNECTICUT

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Abstract.—First distributional records from Connecticut are given for *Atylotus sphagnicola* Teskey, *Chrysops celatus* Pechuman, *C. hinei* Daecke, *C. nigribimbo* Whitney, *Goniops chrysocoma* (Osten Sacken), *Hybomitra daeckei* (Hine), *H. frosti* Pechuman, *H. longiglossa* (Philip), *H. lurida* (Fallen), *H. minuscula* (Hine), *H. nitidifrons nuda* (McDunnough), *H. trepida* McDunnough, *H. zonalis* (Kirby), *Stonemyia isabellina* (Wiedemann), *Tabanus fulvicallus* Philip, and *T. vivax* Osten Sacken. Habitats and flight periods of most species are discussed.

Key Words: bog, fen, *Atylotus*, *Chrysops*, *Goniops*, *Hybomitra*, *Stonemyia*, *Tabanus*

Fairchild (1950) summarized distributional records of deer flies and horse flies in Connecticut. His synopsis, however, is outdated as a result of nomenclatural changes, descriptions of new species, and new state collection records. A current assessment of tabanids in Connecticut would be valuable in light of their considerable importance as nuisance pests and carriers of infectious agents (Krinisky 1976). During the last decade, I have collected tabanids throughout Connecticut to provide new data for my planned revision of Fairchild's (1950) monograph. My extensive sampling of bogs and fens and examination of museum specimens have resulted in many new tabanid records. Here I report the first distributional data for 16 tabanid species in Connecticut to make the information available for the database of North American Diptera which is now in preparation.

MATERIALS AND METHODS

Sampling sites in Connecticut are identified by county, town (geographical subdivision of a county), and additional information if available. The number and sex of

tabanids collected on a given date or by a certain method are given in parentheses. Adults were captured with a hand-held insect net or with a Malaise or canopy trap. The use of the horizontal Malaise trap (D. Focks and Co., P.O. Box 12852, Gainesville, Florida 32608) is discussed by Maier (1984). The canopy trap, which is pictured by Pechuman (1981, Fig. 9), was baited with ca. 4 kg of dry ice to increase the number of specimens captured.

Voucher specimens of tabanids except *Stonemyia isabellina* (Wiedemann) are deposited in the insect collection at The Connecticut Agricultural Experiment Station, New Haven. The adult specimen of *S. isabellina* is retained in the author's collection.

COLLECTION RECORDS AND COMMENTS

Atylotus sphagnicola Teskey

Collection records.—Hartford Co., Burlington, bog near Covey Road, 27 May 1986 (1 ♂). Litchfield Co., Salisbury, shrubby bog by Bingham Pond, 14-16 June 1983, horizontal Malaise trap (1 ♂), 21 June 1985,

horizontal Malaise trap (1 ♀), 12 July 1984, horizontal Malaise trap (1 ♀).

Based on collection records given by Teskey (1983) and those presented here, this species apparently is restricted to sphagnum bogs. In Connecticut, adults fly in parts of bogs dominated by ericaceous shrubs. *Alylotus sphagnicola* was recorded previously from northwestern Connecticut (Teskey 1983), but the record is erroneous (Teskey, personal communication 1985). My collection localities are the two southernmost to date. In Connecticut, adults have been collected between 27 May and 12 July.

Chrysops celatus Pechuman

Collection records.—Litchfield Co., Cornwall, Mohawk Pond, 19 July 1979 (1 ♀), near Hollenbeck River at junct. Conn. Highways 43 and 63, 4 August 1987 (1 ♀); Kent, Leonard Pond Swamp, 9 July 1979 (1 ♀), Mud Pond, 20 July 1979 (4 ♀); Norfolk, marsh at edge of Beckley Pond, 7 July 1986, horizontal Malaise trap (2 ♀). Middlesex Co., East Haddam, bog at north end of Lake Hayward, 3 July 1984, canopy trap (8 ♀), 17 July 1977 (1 ♀), 1–2 August 1984, canopy trap (2 ♀). New Haven Co., Branford, 30 July 1985 (2 ♀), near Stony Creek, 28 July 1948 (1 ♀); Guilford, 4.5 km NNW junct. Conn. Highways 77 and 80, 27 July 1985 (1 ♀); Hamden, 12 July 1928 (1 ♀); New Haven, 9 June 1911 (1 ♀), 28 June 1911 (1 ♀); Madison, 14–15 June 1979, Malaise trap baited with dry ice (1 ♀); Meriden, South Meriden, 7 July 1935 (1 ♀). New London Co., Voluntown, fen in Atlantic white cedar swamp by Beachdale Pond, 19 June 1985, horizontal Malaise trap baited with dry ice (2 ♀), 10 July 1984, horizontal Malaise trap (5 ♀), 16 July 1986, canopy trap (2 ♀), 16–17 July 1986, horizontal Malaise trap baited with dry ice (6 ♀), 7 August 1984, hovering over human (5 ♀), horizontal Malaise trap baited with dry ice (2 ♀), 17 August 1984, hovering over human (1 ♀), Pachaug St. Forest, near Hodge Pond, 21 June 1986 (4 ♀). Tolland Co., Hebron, Tom 2-Pony, Kinney Road, 7 July 1979 (2 ♀); Mansfield, Mt. Hope

River, Laurel Lane, 24 June 1979 (1 ♀); Somers, 12 July 1979 (1 ♀); Tolland, near Tolland Marsh Pond, 28 June 1988, canopy trap (5 ♀); Union, Bigelow Hollow St. Park, 16 July 1979 (2 ♀); Willington, 1.5 km NNE West Willington, black spruce bog, 30 June 1982 (1 ♀). Windham Co., Ashford, Elliot Road, 24 June 1979 (1 ♀); 28 June 1979 (5 ♀), Great Oak Road, 6 July 1979 (1 ♀); Plainfield, cedar swamp, 13 July 1979 (1 ♀); Putnam, 8 July 1953 (4 ♀); Woodstock, Old Turnpike Road, 16 July 1979 (1 ♀).

Pechuman (1949) originally described *C. celatus* as a subspecies of *C. flavidus* Wiedemann. Fairchild (1950) recorded *C. flavidus* from Connecticut, but specimens examined by him are a mixture of *C. celatus* and *C. flavidus*. *Chrysops celatus* is a common species that occurs in a variety of habitats throughout Connecticut. Adults have been captured between 9 June and 17 August.

Chrysops hinei Daecke

Collection records.—Middlesex Co., Deep River, Cockaponset St. Forest, 12–13 August 1977, horizontal Malaise trap (3 ♀); East Haddam, bog at north end of Lake Hayward, 1–2 August 1984, canopy trap (1 ♀); Killingworth, 3 km NW junct. Conn. Highways 81 and 148, 13 August 1985 (3 ♀). New Haven Co., North Haven, 27 August 1983 (1 ♀). New London Co., North Stonington, 3 km WNW Clarks Falls, 14 August 1985 (2 ♀).

This late season deer fly is found mainly in boggy or swampy areas of Connecticut. Jones and Anthony (1964) also reported that it was restricted to swamps. My records indicate adults fly from 1 to 27 August in Connecticut. Lawrence et al. (1976) captured adults in Maryland from 1 August to 12 September.

Chrysops nigribimbo Whitney

Collection records.—Litchfield Co., Cornwall, Mohawk Pond, 19 July 1979 (2 ♀). Middlesex Co., East Haddam, bog at north end of Lake Hayward, 17 July 1985 (2 ♀), 7 August 1986 (1 ♀). New London Co.,

Voluntown, 2 km NE town center, 7 August 1984 (1 ♀), Windham Co., Ashford, Elliot Road, 24 June 1979 (3 ♀), 28 June 1979 (3 ♀).

This species has been captured between 24 June and 7 August in Connecticut, where it is distributed widely.

Goniops chrysocoma (Osten Sacken)

Collection records.—New Haven Co., Guilford, 4.5 km NNW junct. Conn. Highways 77 and 80, 21 July 1983 (1 ♀), 4.0 km NW junct. Conn. Highways 77 and 80, 21 July 1987 (1 ♀).

Both females were resting on vegetation at the edge of a large coastal red maple swamp. My distribution records are the first from New England.

Hybomitra daeckei (Hine)

Collection records.—New Haven Co., Guilford, Chaffinch Island, 14 June 1986 (3 ♀), 19 June 1985 (12 ♀), 19 June 1986 (12 ♀), 26 June 1986 (2 ♀), 3 July 1985 (9 ♀), 15 July 1989 (7 ♀), all from canopy traps. New London Co., Old Lyme, 1 km S junct. Interstate Highway 95 and Conn. Highway 156, 3 July 1986, canopy trap (2 ♀).

All Connecticut localities with *H. daeckei* are salt-marshes where larvae apparently develop. In Connecticut, adults have been trapped between 14 June and 15 July. This flight period is similar in length to the one of 30 May to 26 June recorded in Maryland (Lawrence et al. 1976).

Hybomitra frosti Pechuman

Collection records.—Litchfield Co., Cornwall, Mohawk St. Forest, black spruce bog, 12 August 1986, canopy trap (2 ♀); Norfolk, bog by Beckley Pond, 22 July 1987 (1 ♀).

This species is restricted to sphagnum bogs and possibly fens (Pechuman 1960, 1981, Baribeau and Maire 1983a, b). I collected my three specimens in bogs where the sphagnum mat was shaded partially by black spruce, *Picea mariana* (Miller) Britton, Sterns, and Poggenburg, and by ericaceous

shrubs. Shade may be necessary for larval survival because Baribeau and Maire (1983b) found most of their larvae in a forested portion of an ombrotrophic bog. Based on Connecticut records, adult activity lasts from 21 July to 11 August. This flight period is similar in time and length to that observed in Quebec by Baribeau and Maire (1983c).

Hybomitra longiglossa (Philip)

Collection records.—Litchfield Co., Norfolk, bog by Beckley Pond, 23 May 1988 (1 ♂), 27 May 1988 (1 ♂, 1 ♀), 29 May 1987, canopy trap (13 ♀).

Adults are active at peat pools in the bog mat where ericaceous shrubs are sparse and rarely exceed 0.5 m in height. Males apparently take stations at pool margins because they chase flying insects that pass by them and they mate by pools. This species probably is confined to sphagnum bogs where larvae develop (Teskey and Burger 1976). The specimens captured in Connecticut extend the known range of *H. longiglossa* southward by one state. In Ontario, adults are active from 3 to 29 June (Pechuman et al. 1961).

Hybomitra lurida (Fallen)

Collection records.—Litchfield Co., Canaan, junct. Conn. Highway 126 and Page Road, 23 May 1988 (1 ♀); Norfolk, bog by Beckley Pond, 29 May 1987 (1 ♀); Salisbury, near Bingham Pond, 23 May 1987 (1 ♀).

Adults of this uncommon species are known only from the three localities in northwestern Connecticut listed above. These collection sites are the southernmost ones recorded for this species. Its 2-week flight period in May is about one-half the length of that observed elsewhere in northeastern North America (Lewis and Bennett 1977, Maire 1984a, White et al. 1985).

Hybomitra minuscula (Hine)

Collection records.—Hartford Co., Burlington, 15 July 1976 (5 ♀), 19 July 1976 (3 ♀), bog by Lamson Corner, 25 June 1986,

horizontal Malaise trap baited with dry ice (2 ♀), 9 August 1985 (11 ♀); East Windsor, bog at junct. Morris and Wapping Roads, 22 August 1985 (3 ♂, 3 ♀). Litchfield Co., Norfolk, bog by Beckley Pond, 30 June 1958 (1 ♂), 7 July 1986, canopy trap (3 ♀), horizontal Malaise trap baited with dry ice (2 ♀), 7–8 July 1986, horizontal Malaise trap (2 ♀), 17 July 1958 (2 ♀), 17 July 1970 (1 ♂, 3 ♀), 2 August 1960 (1 ♀), 12 August 1986 (2 ♀), bog by Pond Hill Pond, 12 August 1986 (1 ♀), bog by Tobey Pond, 12 August 1986 (2 ♀), 5 km S town center, 3 August 1984 (1 ♀); Salisbury, bog by Bingham Pond, 12 July 1984, canopy trap (2 ♀), 21–23 July 1983, horizontal Malaise trap (3 ♂, 2 ♀), 3 August 1984, canopy trap (1 ♀). Middlesex Co., East Haddam, bog at north end of Lake Hayward, 3 July 1984 (2 ♀), 24 July 1985 (2 ♂, 1 ♀), 1–2 August 1984, canopy trap (1 ♀), 13 August 1985 (1 ♂, 2 ♀), 21 August 1984, canopy trap (1 ♀); Killingworth, 1.3 km SE Kroopa Pond, 19 July 1973 (1 ♀). New Haven Co., Bethany, 4 August 1951 (2 ♀). New London Co., North Stonington, 3 km WNW Clarks Falls, 14 August 1985 (1 ♂); Voluntown, fen in Atlantic white cedar swamp by Beachdale Pond, 16–17 July 1986, horizontal Malaise trap (1 ♀), 17 August 1984 (1 ♀). Tolland Co., Willington, 1 km SSW junct. Interstate Highway 84 and Conn. Highway 32, black spruce bog, 30 June 1982 (5 ♀), 12 August 1982 (2 ♂, 2 ♀), 0.6 km N junct. Conn. Highways 74 and 320, 13 August 1985 (3 ♂, 3 ♀). Windham Co., Plainfield, 4 km E town center, 10 July 1984 (1 ♀), 20 July 1983 (1 ♂, 2 ♀), 4 August 1982 (1 ♀), 19 August 1983 (1 ♀); Windham, 1.8 km W town center, bog by Plains Road, 13 August 1985 (3 ♀).

In Connecticut, this species occurs exclusively in sphagnum bogs which are the only known larval habitats (Teskey 1969). Baribeau and Maire (1983b) found *H. minuscula* to be the most common tabanid in open areas of bogs. My observations agree fully with their assessment. In open areas of Connecticut bogs, males commonly hover about

1 m above the bog mat while they seek females. My observations indicate adults are active between 25 June and 22 August in Connecticut. The flight period in southwestern Ontario is nearly identical in time and duration (Judd 1958).

Hybomitra nitidifrons nuda (McDunnough)

Collection records.—Hartford Co., Burlington, bog by Lamson Corner, 27 May 1986 (3 ♀). Litchfield Co., Canaan, Robbins Swamp, 23 May 1985 (1 ♀); Cornwall, Mohawk St. Forest, black spruce bog, 11 June 1987 (1 ♀); Norfolk, bog by Beckley Pond, 23–27 May 1988, horizontal Malaise trap (5 ♀), 29 May 1987, canopy trap (4 ♀), 4 km WSW town center, 7 June 1984 (1 ♀), 5 km S town center, 7 June 1984, canopy trap (3 ♀); Salisbury, Benton Hill Fen, 11 June 1987, canopy trap (2 ♀), bog by Bingham Pond, 23 May 1987 (2 ♀), 4 June 1986 (1 ♀), 16 June 1983 (2 ♀), 20 June 1984 (1 ♀). New London Co., Voluntown, 1 km N junct. Conn. Highways 49 and 165, 15 May 1985 (1 ♀), 29 May 1986 (1 ♀). Tolland Co., Willington, 1 km SSW junct. Interstate Highway 84 and Conn. Highway 32, black spruce bog, 20 May 1986 (1 ♀), 3 June 1983 (1 ♀).

In Connecticut, adults inhabit a variety of bogs and fens bordered to some extent by woodland swamps which are the typical larval habitats (Teskey 1969). Adults have been captured between 15 May and 20 June in Connecticut. Smith et al. (1970), Golini and Wright (1978), and Leprince et al. (1983) collected adults over a 4- to 6-week period in Ontario or Quebec.

Hybomitra trepida McDunnough

Collection records.—New London Co., Colchester, 1.5 km N Conn. Highway 16 by Salmon River, 3 July 1985, canopy trap (1 ♀); Voluntown, 1 km N junct. Conn. Highways 49 and 165, 19 June 1985 (1 ♀), 16 July 1986 (1 ♀), 16–17 July 1986, horizontal Malaise trap (2 ♀).

Most specimens are from a fen surrounded by a swamp dominated by Atlantic white

cedar, *Chamaecyparis thyoides* (Linnaeus) Britton, Sterns, and Poggenburg. Like the larval habitats described by Teskey (1969) and Baribeau and Maire (1983b), the fen has abundant sphagnum. In Connecticut, adults have been taken between 19 June and 17 July. Flight periods recorded elsewhere in northeastern North America vary from 2 weeks to 2 months (Pechuman and Burton 1969, Smith et al. 1970, Lewis and Bennett 1977).

Hybomitra zonalis (Kirby)

Collection records.—Fairfield Co., Newtown, Hopewell Road by Aspetuck River, 19 June 1988, canopy trap (1 ♀). Litchfield Co., Salisbury, bog by Bingham Pond, 20 June 1984, canopy trap (2 ♀), fen by Beeslick Pond, 11–23 June 1987, horizontal Malaise trap (1 ♀), 1 km SSE Bald Peak at Wachocastinook River, 4 June 1986, canopy trap (1 ♀). New Haven Co., Guilford, Beaver Head Swamp, 7 June 1984 (2 ♀), 9 June 1984 (1 ♀), 10–11 June 1984, horizontal Malaise trap (1 ♀), 14 June 1987, on dog (1 ♀). New London Co., Voluntown, fen in Atlantic white cedar swamp by Beachdale Pond, 29 May 1985 (1 ♀), 29 May 1986, horizontal Malaise trap baited with dry ice (5 ♀), 10 June 1984 (1 ♀), 19 June 1985, horizontal Malaise trap baited with dry ice (24 ♀), 10 July 1984 (1 ♀).

Adults frequent bogs, fens, and coastal red maple swamps. Teskey (1969) and Baribeau and Maire (1983b) found larvae in Canadian bogs, fens, or both. Larvae probably develop in a wider range of habitats because collection localities in red maple swamps in Connecticut were > 10 km from the nearest bog or fen. Nonetheless, based on trapping records, the largest populations of *H. zonalis* apparently occur in fens associated with coastal Atlantic white cedar swamps. Adults are on the wing at least from 29 May to 10 July, which is a comparable period in length to the one noted in Quebec by Maire (1984b). Smith et al. (1970), Lewis and Bennett (1977), and Baribeau and Maire

(1983c) captured adults over a 3- to 4-week period in other areas in northeastern North America.

Stonemyia isabellina (Wiedemann)

Collection records.—New Haven Co., Hamden, Lockwood Farm, 17–18 July 1982, horizontal Malaise trap (1 ♀).

This lone female was captured in a re-growth forest that is described by Maier (1984). My specimen is the first recorded from New England. Pechuman (1981) has suggested that this species may be uncommon throughout its range. The collection date of my specimen falls within the flight period of 24 June to 31 July reported for six Pennsylvania specimens (Frost and Pechuman 1958).

Tabanus fulvicallus Philip

Collection records.—Litchfield Co., Salisbury, fen by Beeslick Pond, 18–22 July 1987, horizontal Malaise trap (1 ♀). Middlesex Co., East Haddam, bog at north end of Lake Hayward, 24 July 1985 (1 ♀).

Both collection sites have a limited number of small pools on the sphagnum mat, which resemble the areas where Teskey (1969) found larvae. The locality in Salisbury is a rich fen, and the one in East Haddam a minerotrophic bog (Maier 1988) or medium fen. Based on adult captures between 29 June and 20 July in Ontario (Pechuman et al. 1961), the flight period in Connecticut is probably brief, not exceeding 3 weeks in July.

Tabanus vivax Osten Sacken

Collection records.—Litchfield Co., Canaan, 1.2 km SSW South Canaan, 18 July 1987 (1 ♀); Cornwall, near Kellog Corners, 22 June 1988 (1 ♀); Goshen, Allyn Road, 19 July 1979 (1 ♀); Harwinton, Campville, Naugatuck River, 11 July 1985, canopy trap (1 ♀), 18 July 1987, canopy trap (2 ♀); Norfolk, 5 km S town center, 3 August 1985, canopy trap (2 ♀). Middlesex Co., East Had-

dam, bog at north end of Lake Hayward, 3 July 1984, canopy trap (1 ♀).

All localities with *T. vivax* are near streams or rivers. Teskey (1969) also emphasized the presence of streams near his larval collection sites. In Connecticut, adults fly at least from 22 June to 3 August. Pechuman et al. (1961) observed a shorter flight period of 12 June to 17 July in Ontario. Although Pechuman (1981) did not give exact dates of capture in New York, he noted that adults had been captured during June, July, and August.

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